

*Full Length Research Paper*

# Assessment of the practices and perceptions towards age estimation among the sports fraternity in Uganda

Annet Nankwanga<sup>1</sup>, Kutesa Annet<sup>2</sup>, Asiimwe Ismail<sup>3\*</sup> and Nabagala Grace<sup>2</sup>

<sup>1</sup>Department of Biochemistry and Sport Science, College of Natural Sciences, Makerere University, Uganda.

<sup>2</sup>School of Dentistry, College of Public Health, Makerere University, Uganda.

<sup>3</sup>Department of Sport Science, Faculty of Science, Gulu University, Uganda.

Received 2 February, 2021; Accepted 24 March, 2021

Local sports administrators are faced with a challenge of upholding fairness and protecting the health of their players due to the difficulties they face to determine the right age categories of athletes. Therefore, the aim of this study was to explore the practices of how age estimation is performed in the sports fraternity in Uganda. The study was qualitative and it involved 19 participants who were purposively selected based on their position in sport administration. Data was collected using key informant interviews and analyzed using thematic content analysis. The findings revealed that age estimation in sports mainly relied on non-forensic methods such as documents, interviews and birth certificates. Forensic age estimation using magnetic resonance imaging (MRI) was found expensive to be widely used. The challenges associated with wrong age estimation ranged from conflicts, to stifled progression in talent development and potential injuries. The study recommends that a national database that registers people right from birth is put in place and that a standardized national method of age estimation using dental development patterns be relied upon to determine age of athletes especially in sports where age categorization is a requirement.

**Key words:** Age estimation, sports, non-forensic, dental development patterns.

## INTRODUCTION

Sports administrators both in public and private sports institutions are confronted with a challenge of age assessment of athletes. This happens in cases where the athletes are unaware of their exact date of birth yet are required to play in a certain category of competitive sport. In some situations, it is suspected that the athlete claims to be young and would wish to be categorized in a team for young people but in the actual sense he may be older.

In other cases, the athlete may claim to be an adult in order to fit in the adult team, yet he is young. So, when the given age is doubted by the sports authorities, age estimation is performed (Eikvil et al., 2012).

However, in order to maintain the standard of fairness in sports and to protect the health of athletes, it is essential that age limits for sporting competitions are complied with. There are various methods that could be

\*Corresponding author. E-mail: asiimweismail@gmail.com.

used in age estimation that are either scientific/forensic or non-scientific/non-forensic. In the European countries, there is currently no consensus on which methods to use for age assessment. A majority of countries assess age based on a medical examination of bone and/or dental development, physical appearance and interviews, while a few states rely on non-medical assessments only (Eikvil et al., 2012). Various countries also use different margins of precision for each method and different approaches for combining results when several methods are used. Forensic scientists have also developed validated procedures for age estimation in living individuals using scientific methods (Maximilian et al., 2016). These methods have been published for age estimation in competitive sports. The methods make use of the ossification stages of an epiphyseal plate to draw conclusions about an athlete's age. While the non-scientific methods include the measurement system, physical observation of size and strength, use of documentations such as academic result slips, national identity cards, birth certificates among others.

Sports competitions locally and internationally are classified according to age groups to give equal opportunities within the same age group (Engebretsen et al., 2010). International sports competitions require teams and individuals to conform to age categorization and as such local sports institutions are required to carry out age estimation exercises for purposes of eligibility. Similarly, wrong age estimation whether intentional or not could raise ethical issues in sports since it belies the principle of fairness and integrity in competitive sport (Jerome, 2015).

For instance, if young athletes are wrongly classified in the adult team category, it may cause serious consequences that may include fatal injuries, especially in contact sports such as rugby, football and basketball. Therefore, it is very important for both the athletes and the sports authorities that age estimation is done as correct as possible.

This article presents findings from a study that was carried out on practices and perceptions regarding age estimation in competitive sports in Uganda. It specifically looks at the awareness of age estimation among the people working in the sports fraternity, current methods used for age estimation and their reliability, awareness of forensic age estimation in the sports fraternity, circumstances under which forensic age estimation is carried out in sports, consequences of wrongful age estimation, challenges faced by the cadres who perform age estimation, and how the challenges are dealt with.

## **MATERIALS AND METHODS**

### **Study setting and design**

This was a qualitative study conducted between January to March

2020 in eight districts of Kampala, Soroti, Jinja, Wakiso, Masaka, Gulu, Kapchorwa and Mbarara in Uganda. These districts were purposely selected for the study based on presence of knowledgeable and experienced sports officers employed at the district local government. Majority of the key informants were from Kampala which houses most of the sports federations and associations, and a few local government officers were selected from the other seven districts.

### **Selection of the study population**

The study population constituted sports scientists, administrators, coaches and medical doctors working with local sports federations, associations and local governments. The selected sports federations and associations included; Federation of Uganda Basketball Association (FUBA), Uganda Olympic Committee (UOC), Federation of Uganda Football Associations (FUFA), Uganda Swimming Federation (USF), Uganda National Rugby Union (UNRU), Uganda Netball Federation (UNF) and Uganda Cricket Associations (UCA).

These were selected because they are involved in the administration, organization and implementation of most of the sporting activities within the country. The study sample was purposively selected to include only those that were knowledgeable and had relevant information on the study. In total, a sample of 19 key informants was selected for the study. In order to select and identify the key informants for the study, the selected sports federations were visited and permission to carry out the study was sought. The officer in-charge at a given office was requested to provide a list of names and the contacts of sports officers, coaches and medical officers who are directly involved with the study.

### **Interviews**

The interviews were conducted after consent was sought from respondents, who were interviewed at their stations of work. The interview exercise was conducted by the principal investigator as the lead researcher and was assisted by an assistant whose major role was to capture the discussions through a written script and voice recorder. The research assistants went through training in qualitative data collection prior to the data collection process.

Data were collected using a structured interview guide. The interviews were conducted after getting consent from the key informant. They were conducted in English since all the key informants were well versed with the language. The interview lasted for about 30-45 min and all the key informants were compensated for their time. To establish the trustworthiness of this study, the concepts of credibility, transferability, dependability and conformability were considered as decisive factors for quality, based on Guba's four criteria for trustworthiness. Credibility was addressed by describing the methods in detail in the protocol to convey the actual situations that would be investigated. To allow transferability, sufficient detail of the study context has been reported in this article to enable other researchers decide whether the setting is similar to others and whether the findings can be applied to other settings. Dependability has been achieved by describing the methodology clearly to enable a future investigator to repeat the study. While addressing conformability, the findings that emerged from the data were supported by quoting the key informants' own words during the discussions.

Data was analyzed using thematic content analysis. Following the interviews, the data was transcribed verbatim and checked for correctness by cross-checking with all the three data sources (the notes of the researcher, the research assistant and the voice

recorder). The text was then repeatedly read through to identify patterns. The data were coded deductively since there were already predetermined themes. Under each theme, categories were developed to form sub-themes. Also, thick descriptions and quotes were also used to ensure the originality of the data. A validation process was done to check for clarity and accuracy of the findings. The findings were then presented in a narrative form.

### **Study instrument**

An unstructured interview guide was used for data collection and this was developed after seeking expert opinion. The guide comprised of 10 open-ended questions which were divided into the demographics and three broad themes which included; circumstances under which age estimation is required in competitive sports, methods used for age estimation and challenges faced with the practice. The subsequent section provides a description of the instrument regarding the above-mentioned themes.

### **Circumstances under which age estimation is required in competitive sports**

In line with the above theme, we inquired whether the key informants had heard about age estimation in sports. In addition, we also probed if they knew what forensic age estimation was; their opinion if age estimation is required in the sports fraternity; their awareness of policy and guidelines on age estimation; and under which circumstances is age estimation practiced in the sports field.

### **Methods used for age estimation**

Concerning the methods used in age estimation, key informants were asked to describe the practice being used to perform age estimation in the sports field and the cadres who perform age estimation. They were also asked for their opinion whether the mentioned cadres are the right cadres to perform age estimation in the sports fraternity. Lastly, we inquired about the reliability of the methods used and the consequences of wrongful age estimation.

### **Challenges faced with the practice**

For questions relating to the challenges faced with the practice, key informants were asked to highlight the challenges they faced with the practice of age estimation in sports, and we also went further to probe for opinions or views on how these challenges are dealt with. The interview guide allowed the key informants to express their views/opinions on the different aspects of age estimation in the sports field.

### **Data analysis**

Subsequent to conducting interviews, the data was transcribed verbatim and checked for correctness by cross-checking with all the data sources, that is, the researcher notes, the research assistant's notes and the data from the recorder. Data was then analyzed using the thematic content analysis method. Three predetermined themes were derived from the study objective and were envisaged during the analysis. These included circumstances under which age estimation is required in competitive sports, methods used for age estimation in sports and challenges faced with the practice. These

themes were broken down into different categories of sub-themes developed from the coded data. The emerging sub themes were then compared with the data and finally interpreted.

The key informants' quotes were identified and labeled to represent their original ideas. As an example, a quote from respondent 1 would be labeled C1 followed with the first letter of the name of the respondent's district. For example, (C1J) would mean a quote from respondent one from Jinja district. In addition to the letter representing the district, the last digits were representing the job title of the respondent. In a situation where the respondent did not have a job title, then the last digit would represent the type of sport one is involved in, or the federation one is from, or the organization one is coming from like the Uganda Olympic Committee (UOC) or Ministry of Education and Sports (MOE). For instance, the quote code (C1JSO) would mean respondent 1 from Jinja district is a Sports Officer. For example, (C2KCA) would mean a quote from respondent 2 from Kampala district who is a cricket player in the cricket Association. Then (C17 SSO) is a quote from respondent number 17 from Soroti district and is a sports officer. While (C15 MSSO) is a quote from respondent number 15, a sports officer from Masaka district, (C4KSF) means a quote from respondent 4 who is from the swimming federation from Kampala.

The results were compared and verified by an independent person (SA) who performed the analysis and came up with similar findings. Where there were disagreements, discussions were made to come to a common agreement in the interpretation.

### **Ethical considerations**

Approval for the study was sought from Makerere University, School of Health Sciences Research and Ethics Committee (SHSRC) and the Uganda National Council of Science and Technology (UNCST). Permission to carry out the study was also sought from the respective sports federations and informed consent was obtained from the selected key informants in accordance with the Helsinki Declaration. The investigators informed the key informants of the procedure, the objectives and benefits, and any other possible risks involved. Confidentiality was ensured by avoiding the use of personal identifiers by assigning codes to key informants.

## **RESULTS**

The study came up with three predetermined themes which were; circumstances under which age estimation is required in competitive sports, methods used for age estimation in sports and challenges faced with the practice. The key informants' and the sub-themes as they emerged is briefly described.

### **Description of the study participants**

Nineteen key informants were interviewed. They were both females and males within the age range of 32-60 years. Majority 47.3% (9/19) had attained masters' degree, 36.8% (7/19) had bachelors' degree in Sports Science, 10.5% (2/19) had an ordinary diploma' in Sports and Exercise while only 5.2% (1/19) had attained a post graduate diploma in Sports Management and Sports

Nutrition. The average length of time that they had worked in the sports field ranged between 2 and 20 years. The type of sport that they were involved in included swimming, athletics, basketball, wood ball, netball, badminton, rugby, cricket, football and boxing. Their job titles included referee, Sports Administrator, Coach, General Secretary to the Federation, Team Doctor, District Sports Officer, Umpire and a Lines Judge, Vice Chairperson Uganda Youth Football, Instructor of Community Coaches, Technical Director and School Sports Officer.

### **Theme 1: Circumstances under which age estimation is required in competitive sports**

Concerning awareness of age estimation, we inquired from the key informants whether they had heard about age estimation in sports and majority of the responses were in affirmative while a significant number were not cognizant about it as evidenced by one of the key informants who said "No I have not heard about it" (C4KSF). A question was also raised to the key informants if they knew what forensic age estimation was and majority of them expressed that they knew what it was as revealed by one of the key informants who defined it as below;

*"What I know is that these are scientific methods used scientifically to estimate age of humans whether dead or living, to determine their age if there exists a discrepancy" (C1KBF).*

However, though majority of the participants knew the concept of forensic age estimation, a significant number did not have any idea about this concept. When asked whether there is a policy in Uganda pertaining to age estimation, many of the key informants replied affirmatively. While a few of them were not aware if there were any existing policy and guidelines regarding age estimation in sports as pointed out by a respondent, "...am not sure of the policy and any guidelines in that regard" (C8KR). In line with the same subject, another respondent asserted that the policies existed although he also observed that they were not thorough as indicated in the excerpt below;

*"Yes, there are policies but not that rigorous. Since we mainly work with schools, yet the schools have concrete records relating to the players, we use their records. Although at times the records are tampered with for obviously different reasons" (C2KUOC).*

Thus, these findings indicate that some of the key informants were aware about the existence of the policies of age estimation in Uganda but also a significant number of them were not aware of it. When asked whether age

estimation is required in the sports fraternity, majority of their responses were in agreement and only a few had differing views. For those whose views differed, their reason for opposing was that although age estimation is necessary in sports, in some sports it is not a requirement. For example, swimming competitions are open to any age while for other sports like boxing and soccer, it is a requirement. In line with this view, some respondents had this to say;

*"No there is no need to have age estimation in sports because age is just really one aspect. If we are going to go into, let's say contact sport or even any other sport, age is just one aspect; for instance, if you are going to go for swimming and you are going to have a 13-year-old competing against a 20-year-old, sometimes you may find that the 13-year-old may be even better than the 20-year-old. So, in this case, age is no longer a deal, it is about your strength, ability, your psychological preparedness among other things," (C4KSF).*

*"We've never really seen the need to do age estimation, at least not in our sport but it could be different for football and boxing. Well, the idea would be in sport determining age, we don't know whether it is uniform or not, but of course some sports are specific. The age and weight have to be specific, for example, in boxing it is important to have age and weight taken" (C12KMO).*

As regards circumstances under which age estimation is needed, key informants were asked the context under which age estimation is needed in sports and their responses were that it was used to categorize players and teams to avoid mixing of age groups, as this could result into serious injuries. It was also used for eligibility to play or for grouping athletes/players for ball games competitions such as under 12, under 14, under 17 or under 21 years among others. According to the findings, the age and weight have to be specific, for example, in boxing it is important to have age and weight taken in order to level the playing ground as pointed out by one of the respondents that *"The key thing really is to promote fairness. Yeah, you just want people to almost have an equal playing ground so that they don't hurt each other" (C8KRU).*

Another reason that was given for carrying out age estimation was to increase transparency in competitions in sports and reduce perceptions of cheating. This implies that there should be players/athletes of same age category competing at the same level. Meanwhile, another respondent added that it is for purposes of integrity as explained in the excerpt;

*"I think also integrity because we've actually had*

*sports events where we know that some clubs, universities have actually hired mercenaries, so it just spoils the whole integrity of the event and you wonder is it really legitimate or its just for the sake! So, beyond fairness, I think there need to have integrity in the game” (C4KSF).*

Another respondent who had a similar view had this to say;

*“It is very common for sports men and women to lie about their age and use all possible means to lie in the absence of legitimate ways. We need to have proper ways of minimizing such lies by performing age estimation tests” (C12 KMO).*

The above statements signify that when playing for competitions, the participants should be of the same age to promote fairness and integrity as pointed out in the findings. This can only be achieved through performing age estimation tests. To explain this further, one of the key informants said *“I want to believe that it would be very unfair to have an 18-year-old competing with a 12-year-old regardless” (C1KBF).*

Contrariwise, though age estimation was seen as a good practice that could help level the playing ground and help to avoid injuries in competitive sport, some key informants had differing views about it. According to their opinion, age estimation was viewed as a problem in sports since it could discourage some people from participating as reported in the excerpts below;

*“You know age can actually be a problem. Yeah, in the event that Aya is winning every other competition, you know whenever there is no much, much competition, there is an effect on those who are not doing what the best is doing. More so, if that person’s age is out of range... I’m assuming if a 13-year is competing with a 21-year old who is doing badly... and what if the 13-year-old is actually too good for his age and needs to grow, then the 21-year old will be discouraged” (C6MSO).*

*“If I can go back a bit, being older is not always an advantage in a sport like swimming. Swimming is an early peak sport, most people peak in their late teens and early 20s so you can’t tell me that by bringing an older party, so I can’t compete with a 14-year old!” (C4KSF).*

Further, probing on this theme revealed that there are circumstances where age estimation could be depicted negatively as a restrictive factor as revealed in the responses below;

*“But I also want to say that age restriction, just like*

*eligibility is not fair. I give an example of university sport, where they say you compete up to a certain age and yet there are mature entrants, and there are people who stay in school for a longer time. So, age can actually make sport restrictive in a negative way (C3JSO).*

*“And sometimes if you also start moving age eligibility, it affects people. I know someone who was affected, he expected to go to the university but that year, they decided to lower the eligibility, yet he was already training,” (C4KSF).*

### **Forensic age estimation**

A question was posed about the circumstances under which forensic age estimation could be used in Uganda and the following were the responses raised:

It is needed where athletes lie and are insincere about their age (C15MSSO) and where there are doubts about the athlete’s age as reported in the excerpt below;

*“We should stick to documents but where there are doubts, we should add some scientific means to prove whether the documents are specifying the right age” (C4KSF).*

In circumstances where some people do not know when they were born, and they also do not have a birth certificate as mentioned by one of the key informants’,

*“To have a birth certificate, it is a challenge in Africa because of lack of proper registries. Some children are born in banana plantations in home environments and not hospitals and their parents do not even remember the dates their children were born” (C6KC).*

According to some key informants, forensic age estimation is done when there is need to categorize players and teams to avoid mixing of age groups when playing games as this could result into fatal injuries including death. In Uganda, categorizing players is commonly done at national level when the national team prepares to play with international teams during international soccer leagues. This is possible because normally the national teams are funded by FUFA and other organizations, so it is able to fund the process of age estimation since it is a requirement at that level.

It is also done when there is need to increase on transparency in competitions in sports or where there is need to reduce on the perception of cheating in sports and promote fairness in the sport/game and likewise where there is need to track talent in sports.

## Theme 2: Methods used for age estimation

Considering the methods used in age estimation, key informants were asked to mention the methods used while estimating age in sports competitions and their responses included use of both the scientific and non-scientific methods. The non-scientific methods included use of height, half height and weight (the unit system), use of authentic documentations such as birth certificates, passports, academic results slip such as Uganda National Examination Board (UNEB) results slips, and national identity cards.

As regards height and weight method, one of the key informants who was a sports scientist said that they have been using height, half height and weight as a standard measure and affirmed that “at the moment we use height, half height and weight; it is the standard kind of measurement that has been used since, but if there can be any other provision, we would really welcome it” (C11GSO).

While other key informants reported that they were doing it subjectively through physical observation by looking at one’s physique, height and size, one of the key informants emphasized that games like rugby really depend on one’s physique and strength because there is a lot of struggling for the ball (C9KR).

When asked to explain further how the process of age estimation is done subjectively, this is what he said;

*“Basically, for under 14 and under 12, we use measurements such as BMI. Yes, we take the height against the weight. And sometimes it is a bit rudimentary; where there is no weight or height, we always just look at a child and judge his or her age. You look critically to see the features that make this child to be young or old” (C19WSO).*

*“Sometimes we use birth certificates, but that one you know it can be manipulated anyhow. So, in case of that, we also base on some background information about the child. Say for example, the community can come up and say that one is not young, that one is very old. So sometimes it might be biased information, but we also consider some few aspects in case a team or a player is being doubted by people” (C3JSO).*

*“For the districts when they come for national competitions the teachers use some unit measurements of weight plus half height and height which should not go beyond a certain total measure in order to be included... if you don’t fall within the required units you are then excluded even if you are within the required age, this is a Ministry guideline that we follow,” (C13K MOE).*

The above extracts explain some of the non-scientific

methods that were reported as the methods used in age estimation amongst athletes.

Other responses on the methods used in age estimation included use of scientific methods such as determining bone age using x-rays especially among the younger age and basic measurements using the standard graphs for population height and weight, age for a specific population. According to one of the key informants who was a team doctor, age estimation in Federation of Uganda Football Associations (FUFA) is done by use of MRI to estimate the age of players who play in competitions during national or international leagues. This is done by looking at joint structures and fusion of bones at the epiphyseal plate as explained in the excerpt below,

*“...so, in FUFA we have been doing MRI procedures to estimate the age limit in order for one to participate. It doesn’t show that it is accurate but at least we look at some structures like in the wrists, hand and in the knees to see the fusion of the bones,” (C12KMO).*

As regards how it is done, the above respondent explained that the MRI results are categorized in stages, that is, stages 1 to 5 and above. Stage 1 and 2 or 3 indicates that the athlete is still young while those beyond stage 5 means he/she is above 17 years old. It was also revealed that some participants are actually disqualified when they go for international leagues following a repeat test, even if they passed the tests in their home country as revealed below;

*“Actually, when we had a tournament of AFCON under 17, we went there, and some players were disqualified; they went to school when they were over age. So, they were disqualified by the event’s organizer? ... we did our tests here, but when we went there, they did also repeat theirs. We went with 20 players and 2 were disqualified saying they were slightly above age... however there are variations in growth, so if someone is 20 years, 18, 19 he can pass the test to be under 17, it depends on the development process... someone can develop faster than the other, yeah there are individual variations” (C12KMO).*

## The cadres who perform age estimation

As regards people who perform age estimation, key informants were asked to state who the people who carried out age estimation in sports were and their responses included event organizers, coaches, qualified people like physical education teachers, sports scientists and medical personnel. In addition, one of the key

informants emphasized that the scientific methods are normally performed by medical professionals like the radiologists and dentists, while the non-scientific methods are performed by event organizers, coaches, sports scientists or physical education teachers (C5MBSO). In primary and secondary schools, age estimation is done by the secretariat for primary and secondary schools associations which handle issues bordering on accrediting of players and screening them to participate in the championships.

Further interrogation with one of the key informants on the issue of who does the measurement as well as the screening for primary at district and national level competitions revealed that age estimation is done by physical education teachers as pointed out in the excerpt below;

*"We've basically given the benefit of doubt to the schools who come with children from the primary category; this is normally done by the physical education teachers who are trained to do age estimation" (C13K MOE).*

Meanwhile, the people who carry out age estimation for secondary school games at district level one respondent had this to say,

*"We also have a reserve committee or a sports committee in charge and that committee comprises different teachers and head teachers and those are the people who lead in the screening process prior to the commencement of the sports competitions at district level" (C3 KUSSSA).*

When asked whether these are the right people required to perform age estimation procedure, some key informants reiterated and said that some coaches lack the science background that is necessary for carrying out age estimation, and emphasized that this should only be carried out by well-trained professionals as pointed out in the excerpt below;

*"Although coaches can do the age estimations, we always don't involve them especially in measurements because they would begin favoring their own teams, so we have some professionals like physical education teachers whom we trust and are really conversant with the methods of taking the height, half height and the weight compared to the coaches who may not know the science involved" (C11GSO).*

### **Reliability of the methods used in age estimation in sports**

Pertaining to the reliability of the current methods used in

providing accurate results in age estimation, key informants were asked to give their views on the reliability and accuracy of the methods used in age estimation and their responses were not assenting as shown in the ensuing excerpts.

According to the above listed views, the current methods that are used in age estimation in the sports fraternity are considered not reliable because they mostly use the non-scientific methods that are not objective except for national or international leagues where they use scientific methods such as MRI to ascertain age for their players. This is because these leagues have access to funding. The key informants also contended that the non-scientific methods are subjective and are bound to leave out the good athletes because of wrongful age estimation.

### **Consequences of wrongful age estimation**

We posed a question regarding the consequences that could arise from erroneous age estimation and one of the key informants had this to say;

*"When you look at the growth pattern of the different regions in Uganda, it is diverse. Like in the northern part of the country, you may look at someone being muscular, but on the other way round the person might not have grown, so I would say the growth pattern might not be as it is in the central part of the country; the kind of feeding ...might differ from what the people in the north have. You would find a kid in P.7 in the north who is taller than me but looking at the way they behave they are young. So, if this kid is put through the coefficient, they might be out of range and hence left out, and this is what is happening on ground. We are leaving out more of the children that we could develop their talents so that they become better athletes in the future. They are left out because of this kind of measurements" (C11GSO).*

In line with the same question, some key informants reported that when athletes lie about their age, there will be increase in the risk of getting injuries especially in high contact games such as rugby and football; some injuries such as concussion maybe life and career threatening. For instance, say a 16-year old playing/competing in an under 21 game is likely to get injured if he is not physically well-built.

Wrongful age estimation may also lead to discouragement regarding continuity from the older players who drain the young ones and their performance level will go down completely. According to a respondent, the kind of spirit of competition may also be reduced and there will be no fairness based on competition (C14

KPSO).

The findings also revealed that wrongful age estimation could result into psychological frustration and demoralization of the young players who lose out unfairly due to defective age estimation. For instance, sometimes you are of the right age but because you are fat, your weight tends to increase, thus causing the measurement units to be high and this will cause you to be eliminated even if you are young. For secondary level, they are even more stringent now; they want to look at the time you did your PLE (C13KMOE). It was argued by one of the key informants that wrongful age estimation could actually lead to cancellation of the game, as well as loss of career as pointed out that *"You are at times punished by way of banning or cancellation of the game"* (C6KPSO).

It was also revealed that wrongful age estimation could lead to conflicts, fights, loss of talents and even total withdrawal from participation in sports by individuals, teams or schools as argued out in the excerpt below,

*"Wrongful age estimation causes a lot of pressures, because sometimes teams start partitioning and then there are a lot of fights; and then the other thing, when it has happened people feel offended; most schools pull out, they may not even want to participate anymore because they will sense the attitude of biasness, and they will say oh these people are biased, then they will make their own teams. So, we would love to have a better way of screening these children, without causing chaos which is not appropriate, because now this one is just visual; sometimes even the person measuring can decide to say, this one is right or this one is not right. And also, the other aspect is that we miss out a lot of talent because we were saying we are doing BMI of children and then there are those who are very talented and because the system is not so well, they will push them very far out or they will push them in even if they do not qualify just because you are using the system which is not right"* (C10GSO).

Contrary to the above findings, there were also positive attributes that were mentioned such as building success, fame and pride of a team/player who excels in the game/sport (C15 MSSO).

### **Theme 3: Challenges faced with the practice**

Concerning the challenges encountered, key informants were asked to highlight the challenges faced by the event managers, sports officers, physical education teachers or coaches in carrying out the exercise of age estimation among athletes prior to events. A number of responses on the challenges were pointed out that included the following;

1. It is a costly process that requires large amount of funds Yet sports in Uganda is underfunded. Regarding the high cost one key informant had this to say;

*"Though the only bit about scientific methods is that some of them are really expensive, we need to have the one which is affordable"* (C4KSF)

2. There is lack of equipment, skills and technology relevant in forensic age estimation (C18 KUOC).
3. There is lack of training and personnel to do forensic age estimation rightfully in the field of sports (C17 MSO).
4. It is a longer process compared to the non-scientific one hence time-consuming (C12 KMO).

### **Dealing with the challenges encountered in age estimation in sports**

Key informants were asked to suggest ways in which the challenges encountered in age estimation in sports in Uganda could be dealt with and the following were their views;

1. There is need to implement a clear policy on age estimation in the field of sports in Uganda.
2. There is need to improve the process of data capturing (NIRA) that are accurate and accessible when needed and also have in place systems of registrations at birth.
3. It is also important to have formal tracking of people who are on a team through documentations such as authentic birth certificates (C6KC).
4. It is important to enhance scientific methods of age estimation like dentition, radiology, orthopedic and scanning. This should involve training personnel in the sports fraternity on issues of age estimation (C7KF).
5. There is need for sensitization of stakeholders regarding the benefits of performing age estimation tests.
6. There is need to punish offenders e.g., banning them from participating in the games over a period of time, or deduct points from offenders and award them to the victims so that this act is minimized or even ceased (C3KUSSSA).
7. There is need to improve on the predetermined scientific and medical approaches, which are more authentic and applicable to the Uganda situation as pointed out by one of the key informants, *"my recommendation basing on the current measurement, I feel if new invention is brought which is scientifically proven then we would really bring others that can participate in these events fully and that is our plea"* (C11GSO).
8. There is need to fund the process of age estimation in the sports field (C4KSF).
9. There is need to carry out training of personnel to do forensic age estimation rightfully in the field of sports

(C17 MSO).

## DISCUSSION

In sports, especially high contact competitive sports like football, rugby and boxing, age estimation is done to ensure the spirit of “fair play” (Dvorak et al., 2007). The fundamental bedrock is the integrity of competition which is vital in ensuring participants are given equal opportunities to participate in their rightful age categories to ensure continuity through the various age categorize. In the same spirit of fair play, right age estimation has the potential to greatly minimize injuries that may result in physical contact and might expose the young athletes to injuries.

For coaches and physical education teachers, age is relevant not only to teach skill but also to match athletes accordingly. There is an association between an athletes’ maturity and the skill set specific to sports, especially ball-games such as soccer (Njeri et al., 2017). Furthermore, age, body size and stage of growth have a considerable contribution to skill acquisition and development which is bedrock of various talent identification and development experts (Helsen et al., 2005). Therefore, age estimation in sports is vital for long term latent identification and development.

The exercise of age estimation in formal and informal competitive sport is especially relevant in events where age is a criterion for inclusion. The events where society expects conformity to social characteristics such as sex and gender, age is equally important to determine who participates and who does not. These social phenomena extend to not only local competitions but as well as international competitions such as Olympic Games (Kassing et al., 2004, p. 374). Furthermore, there is relationship between aging and growth and development of physical attributes such as strength and height which require that athletes are well categorized according to age.

The study discovered that sports administrators and coaches have relied on non-scientific methods of age estimation in Uganda especially documents which are usually unreliable, because in part, players and their guardians are unsure of when they were born. This result in players being denied an opportunity to compete and in worse case scenarios, teams and players have been disqualified from competitions. The result of this is because birth registration in most developing countries like Uganda is still too low (United Nations Children’s Fund, Every Child’s Birth Right: Inequities and trends in birth registration, 2013).

The current methods used by coaches and sport administrators are unreliable, prone to forgery and other fraudulent tendencies. This is in part due to unregistered births practices that are common in low-income countries

where most families are from humble socioeconomic backgrounds. However, there are recommended age estimation and forensic age estimation methods which may be standardized by practitioners and can be applied widely within the realm of sports in Uganda (Timme et al., 2017).

The study revealed that a significant number of sports institutions both public and private carry out age estimation in their competition which in the spirit of “fair-play”, prevent injuries in high contact sport and ensure continuity in the talent development stratum (Engebretsen et al., 2010). This is in line with international sports institutions recommendations which require conformity to eligibility criterion on age categorization and upholds the ethical values in sports.

The absence of a standardized age estimation policy in Uganda means that various medical and non-medical methods could be used, yet some may not really be adequate (Eikvil et al., 2012). However, due to huge financial constraints that are involved in medical based age estimation assessments, sports rely on non-medical assessments which are vulnerable to fraud and subsequently lead to disqualification from competition.

The cadres that are involved in age estimation in sports sector in Uganda are predominantly “non-trained” personnel in this field. This brings about less confidence in the process and compromises the integrity of their work in part due to shortage or total lack of training, as well as brings conflicts during competitions especially where an athlete’s age was doubted in the first place. It is therefore vital that trained professionals in this field be relied upon since they are holders of a public trust (Franklin and Noble, 2015).

The biggest challenge to age estimation in Uganda is the absence of easily verifiable records (James, 2020). Local sports institutions struggle to have verifiable records of athletes which creates a ground for fraud whether intentional or otherwise (Engebretsen et al., 2010). This is further compounded by the shortage of qualified cadres to carry out age estimation or interpret medical age estimation assessment which leaves a gap in the practice of age estimation.

Furthermore, in the absence of reliable and credible age identification documents, sport institutions and administrators have relied on various methods to determine age of participants; chief amongst them is one’s physical and muscular skeletal development (Senn and Weems, 2013; UNICEF, 2013). Dental development is used in judicial system and other clinical practice although the method has not yet been applied in the realm of sports.

## Conclusion

The study showed that the current practices in age

estimation in sports are largely non-medical, and are therefore prone to fraudulent practices, where required medical based age assessments are carried out but are too expensive and therefore not widely applicable. The absence of a national standardized policy and procedures on age estimation further compound the problem, therefore cost-effective forensic age estimation methods such as dental development methods will greatly contribute to the field of age estimation in sports.

## Recommendations

It is necessary to:

1. Scale up the birth registration system to all rural parts of the country and develop a national data base that can be accessed in case age of an athlete is doubted.
2. Advocate for use of dental development age assessment as a standardized forensic procedure for age estimation in sports because it is relatively cost effective compared to MRI and also more reliable in the absence of easily verifiable documents.
3. Train cadres in the area of age estimation in sports in order to eliminate the likelihood of fraud in sports and uphold the spirit of fair play and ethics.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## REFERENCES

- Dvorak J, George J, Junge A, Hodler J. (2007). Age determination by magnetic resonance imaging of the wrist in adolescent male football players. *British Journal of Sports Medicine* 41(8):497-500. <https://doi.org/10.1136/bjism.2006.031021>.
- Engebretsen L, Steffen K, Bahr R, Broderick C, Dvorak J, Janarv P, Steen H (2010). The International Olympic Committee Consensus Statement on age determination in high-level young athletes. *British Journal of Sports Medicine* 44(7):476-484.
- Eikvil L, Kvaal SI, Teigland A, Haugen M, Groggaard J (2012). Age estimation in youths and young adults. a summary of the needs for methodological research and development." Oslo: Norwegian Computing Center pp. 1-26.
- Franklin D, Noble J (2015). Forensic age estimation in living individuals: methodological considerations in the context of medico-legal practice. *Research and Reports in Forensic Medical Science* 5:53-66.
- Helsen W, Van Winckel J, Williams M (2005). The relative age effect in youth soccer across Europe. *Journal of Sports Sciences* 23(6):629-636.
- James B (2020). Can age cheating in football be eradicated. <https://www.newvision.co.ug/news/1518536/age-cheating-football-eradicated> 63 23 08
- Jerome TM (2015). The Ethical and Social Implications of Age-Cheating in Africa. *International Journal of Philosophy* 3(1):1-11. <https://doi.org/10.11648/j.ijp.20150301.11>
- Kassing JW, Billings AC, Brown RS, Halone KK, Harrison K, Krizek B (2004). Communication in the community of sport: The process of enacting, (re)producing, consuming, and organizing sport. *Annals of the International Communication Association* 28(1):373-409.
- Maximilian T, Jürgen MS, Andreas S (2016). Age estimation in competitive sports. *International journal of legal medicine* 131(1):225-233. Accessed on <https://pubmed.ncbi.nlm.nih.gov/27743021> DOI: 10.1007/s00414-016-1456-7.
- Njeri E, Gichangi P, Liversidge HM, Butt F, Gikenye G (2017). Dental age estimation in a group of Kenyan children using Willems' method: a radiographic study Dental age estimation in a group of Kenyan children using Willems' method: a radiographic study. *Annals of Human Biology* 44(7):614-621. <https://doi.org/10.1080/03014460.2017.1371794>
- Senn DR, Weems RA (2013). *Manual of forensic odontology*. 5th ed. United States: Taylor and Francis.
- Timme M, Steinacker J, Schmeling A (2017). Age estimation in competitive sports. *International Journal of Legal Medicine* 131(1):225-233.
- UNICEF (2013). *Age Assessment: A Technical Note*. New York: United Nations Children's Fund (UNICEF). [internet]. [cited 2016 July 11]. Available from: <http://www.refworld.org/docid/5130659f2.html>.